The Intercontinental Journal of
Internal Medicine

DOI: 10.51271/ICJIM-0030

Original Article

ABO and Rh blood group distribution in ANA positive patients

Ömer Faruk Alakuş[1], İhsan Solmaz[2], Sedrettin Koyun[3]

[1]Department of Internal Medicine, Bismil State Hospital, Diyarbakır, Turkiye
[2]Department of Internal Medicine, Gazi Yaşargil Training and Research Hospital, University of Health Sciences, Diyarbakır, Turkiye
[3]Department of Internal Medicine, Kızıltepe State Hospital, Mardin, Turkiye

Cite this article: Alakuş ÖF, Solmaz İ, Koyun S. ABO and Rh blood group distribution in ANA positive patients. *Intercont J Int Med.* 2024;2(2):29-31.

Corresponding Author: Ömer Faruk Alakuş, omerfaruk01@gmail.com

Received: 24/03/2024 ◆ **Accepted**: 14/05/2024 ◆ **Published**: 29/05/2024

ABSTRACT

Aims: Antinuclear antibody (ANA) positivity is a common finding in various autoimmune diseases, particularly those of rheumatologic origin. While ANA positivity alone may not be diagnostic, it serves as a valuable marker when supported by clinical findings, aiding in the diagnosis and prediction of autoimmune diseases. The relationship between blood group systems and various diseases has been an area of interest in medical research. In this study, we aimed to investigate the potential association between ABO blood group and ANA positivity, specifically examining whether the ABO blood group status poses a risk for autoimmune diseases in individuals with rheumatologic conditions.

Methods: In this retrospective study, we analyzed the blood group data of 536 patients who tested positive for ANA and were receiving treatment for rheumatologic diseases. The blood group status of these individuals was determined using standard serologic techniques. The distribution of ABO and Rh factor blood groups among ANA-positive patients was compared with the blood group distribution in the general population. Statistical analysis was performed to assess any significant differences.

Results: The analysis revealed that the distribution of ABO and Rh factor blood groups among ANA-positive individuals did not show a statistically significant difference compared to the general population. Specifically, there was no significant deviation in the prevalence of ABO blood groups (A, B, AB, O) or Rh factor (positive or negative) among ANA-positive patients compared to expected frequencies based on population data.

Conclusion: Based on our findings, there appears to be no significant association between ABO blood group status and ANA positivity in patients with rheumatologic diseases. The distribution of ABO and Rh blood groups among ANA-positive individuals closely resembled that of the general population. Therefore, our study suggests that current blood group status may not serve as a predictive factor for autoimmune diseases in individuals who test positive for ANA. Further research is warranted to explore other potential factors contributing to autoimmune disease susceptibility.

Keywords: ANA, ABO, blood group

INTRODUCTION

Anti-nuclear antibody (ANA) refers to antibodies developed against nuclear antigens in cells by the immune system that has lost tolerance to its own cells. The ANA test is a test in which anti-nuclear antibodies are measured in the blood by different methods and can be found positive at varying titers in serum in many autoimmune diseases, especially systemic lupus erythematosus (SLE), and guides the clinician.[1] ANA positivity may become positive in autoimmune diseases including SLE, Sjögren's disease, systemic sclerosis, myasthenia gravis, Hashimoto's thyroiditis, and inflammatory bowel disease, as well as in diseases including chronic active hepatitis, infectious mononucleosis, infective endocarditis, tuberculosis, and HIV. A positive test alone is not diagnostically significant. A titer above 1/160 is considered positive by the IFA (immunofluorescent antibody) method.[2] Apart from all these diseases, ANA positivity can also be detected in healthy individuals. Asymptomatic ANA positivity is present in 15-20 percent of the population. The significance of the majority of ANA positivity seen in healthy individuals is unknown, but most of them have benign causes. However, some of these individuals are at risk for autoimmune diseases.[3] Therefore, ANA testing is generally important in rheumatology and immunology practice.

Genetic and environmental factors have been shown to be associated with the incidence of rheumatologic diseases, and many studies have been conducted on this subject. However, the pathogenesis of rheumatic diseases has not been fully elucidated. Many studies have shown that ABO blood groups,

This work is licensed under a Creative Commons Attribution 4.0 International License.

one of the blood grouping systems, are associated with many diseases.[4] In this study, we tried to investigate whether there is a relationship between ANA positivity, which can be a predictor for autoimmune diseases, especially rheumatologic diseases, and the ABO and Rh factor blood grouping systems.

METHODS

The study was carried out with the permission of Ethical Committe of Diyarbakır Gazi Yaşargil Training and Research Hospital (Date: 05.07.2023, Decision No: 2023-25). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

This study was planned retrospectively, and the study population consisted of 1419 patients with positive ANA results who were followed and treated for rheumatologic diseases in the Internal Medicine and Rheumatology Outpatient Clinics of University of Health Sciences Diyarbakır Gazi Yaşargil Training and Research Hospital between January 1, 2017 and December 31, 2019. The data of these patients was scanned from the hospital automation system, and 536 patients whose blood group could be determined were included in the study. Patients whose blood group could not be determined were excluded from the study. These ANA test-positive patients were categorized according to their blood groups and compared with the data in the blood group study conducted with 127091 people in our province in 2019 as a control group.[4]

Statistical Analysis

Statistical evaluation was performed using SPSS 22 for Windows (IBM SPSS Inc., Armonk, NY, USA). Chi-square test was used to compare categorical data. In statistical analyses, $p<0.05$ was considered significant.

RESULTS

The blood group distribution of normal individuals in our province was 39.7%, 18.6%, 33.6%, and 8.1% with blood groups A, B, O, and AB, respectively. Rh (+) was 88.4%, and Rh (-) was 11.6%.[4] Data of 1419 patients with rheumatic diseases who were followed up in rheumatology and internal medicine outpatient clinics were examined. The blood group distribution of 536 patients with blood groups in the hospital automation system was determined as A, B, O, AB as 37.12%, 17.72%, 36.3% and 8.76%, respectively. Rh (+) was 88.99%, Rh (-) was 11% (Table).

Table. Blood group distribution and analysis of ANA+patients and healthy individuals

	ANA (+) patients (%)	Blood group distribution in the population of Diyarbakır, n (%)	X^2	p
Blood group A	199 (37.12)	50449 (39.7)	1.471	0.225
Blood group B	95 (17.72)	23678 (18.6)	0.290	0.590
Blood group O	195 (36.3)	42728 (33.6)	1.822	0.177
Blood group AB	47 (8.76)	10236 (8.1)	0.368	0.554
Rh+	477 (88.99)	112390 (88.4)	0.164	0.686
Rh-	59 (11)	14701 (11.6)	0.164	0.686

ANA: Anti-nuclear antibody

DISCUSSION

Many studies have been conducted on the role of blood groups in different diseases. It has been shown that the risk of thromboembolic events and cardiovascular diseases is higher in individuals with blood groups other than blood group 0.[5] In addition, it has been found that the likelihood of severe plasmodium falciparum infection is high in individuals with blood group 0.[6] In a study on blood group distribution in COVID-19 patients during the recent COVID-19 pandemic, it was found that ABO blood group distribution was the same as the normal population in individuals with COVID-19, Rh factor negativity was protective against COVID-19, and Rh factor positivity was predisposed to the disease.[7]

Many studies have been conducted on the relationship between rheumatic diseases and blood groups. In a study conducted by Çildağ et al.[8] in the immunology-rheumatology clinic, it was found that Rh factor positivity was higher in all rheumatic diseases. In this study, although there were no data on the normal population, the most common blood group in all rheumatic diseases was A, followed by 0, B, and AB, respectively, as in other studies conducted in our country. In this study, it was shown that the blood group distribution in rheumatic diseases was generally the same as in the normal population when compared with other studies. However, it was found that blood group A was higher in rheumatoid arthritis and spondyloarthropathies, and blood group 0 was higher in systemic lupus erythematosus and FMF. In our study, the blood group of patients found to be ANA positive was A>0>B>AB, respectively. Considering those rheumatologic diseases such as SLE and Sjögren's disease have the highest rate of ANA positivity, the most common blood group in this group was blood group A in our study, which was the same with the normal population.

In our study, when the ABO blood groups of ANA-positive patients and normal individuals taken as the control group were compared in terms of ABO blood groups, it was found that they were proportionally similar. In the statistical analysis, no statistically significant difference was observed between ANA-positive patients and healthy individuals.

ANA-positive individuals were also classified according to Rh-factor results and compared with the normal population in terms of Rh-factor results. No statistically significant difference was observed between the groups in terms of Rh factor results.

It is obvious that the ANA test, which is associated with many diseases, especially autoimmune diseases, is an important marker for clinicians in the diagnosis and treatment follow-up of many diseases if it is performed at the right time and in cases of significant clinical suspicion. The main diseases in which ANA positivity is important are autoimmune diseases, whose etiologies are still not fully elucidated. In our study of 536 patients with ANA positivity, we investigated whether there was a relationship between ANA positivity, which can be a predictor for autoimmune diseases, and blood group. We concluded that there was no significant difference from the normal population. Further studies on the relationship between genetic and environmental factors and autoimmune diseases, especially rheumatologic diseases affecting many systems, are needed.

Limitations

Our study has some limitations. First of all, we did not classify the patients included in our study according to rheumatological disease subgroups. Additionally, our study, which included 536 patients, was conducted using data from

a single center. If our study was multicenter, we could make additional contributions to our study by including a larger patient population in different geographies.

CONCLUSION

Conditions that predispose to autoimmune diseases are the subject of current studies. Studies in this field aim to predict individuals with autoimmune diseases and to determine the treatment strategy accordingly. In our study, we aimed to determine whether blood group is a predictor for autoimmune diseases by comparing the blood group of ANA test positive individuals followed up for rheumatologic diseases with the normal population. The retrospective design of our study and the fact that it was a single center study, we think that the current findings should be confirmed by studies conducted in larger populations. In addition, we believe that further research on the relationship between autoimmune diseases and genetic and environmental factors is needed.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of Ethical Committe of Diyarbakır Gazi Yaşargil Training and Research Hospital (Date: 05.07.2023, Decision No: 2023-25).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Bossuyt X, De Langhe E, Borghi MO, Meroni PL. Understanding and interpreting antinuclear antibody tests in systemic rheumatic diseases. *Nat Rev Rheumatol.* 2020;16(12):715-726.
2. Solomon DH, Kavanaugh AJ, Schur PH; American College of Rheumatology Ad Hoc Committee on Immunologic Testing Guidelines. Evidence-based guidelines for the use of immunologic tests: antinuclear antibody testing. *Arthritis Rheum.* 2002;47(4):434-444.
3. Li QZ, Karp DR, Quan J, et al. Risk factors for ANA positivity in healthy persons. Arthritis Res Ther. 2011;13(2):R38.
4. Arac E, Solmaz I, Samanci S. ABO and Rh blood groups frequency in men, women and neonates in Diyarbakir province. *Ann Med Res.* 2019; 26(12):2876.
5. Franchini M, Makris M. Non-O blood group: an important genetic risk factor for venous thromboembolism. *Blood Transfus.* 2013;11(2):164-165.
6. Degarege A, Gebrezgi MT, Ibanez G, Wahlgren M, Madhivanan P. Effect of the ABO blood group on susceptibility to severe malaria: a systematic review and meta-analysis. *Blood Rev.* 2019;33:53-62.
7. Araç E, Solmaz İ, Akkoç H, et al. Association between the Rh blood group and the Covid-19 susceptibility. Int J Hematol Oncol. 2020;30(2): 81-86.
8. Çildağ S, Kara Y, Şentürk T. ABO blood groups and rheumatic diseases. *Eur J Rheumatol.* 2017;4(4):250-253.